Status of L1 CFT/CPS Simulation: CFT, CPSAxial and CPSStereo

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DFE Boards

Made fixes to algorithms as discussed in the Jul. 26 meeting:

- Mark track as isolated , if it is the only one in a sector AND there no tracks in the two adjacent sectors

- Fix defintion of isolated electron - an isolated track with an axial PS match is an isolated electron

- Fix the order in which tracks are chosen in a sector

- Need to finish: Correct the cluster information sent at L1 accept (DFEBoardL2CPSAData)- waiting to hear back from Levan/Manuel

- Send DFEBoardL2Data without VRB mangling so that L2STT can read it (details later)

CPS Clustering

CPS Axial Clustering:

- Axial Clusters are made - LO threshold only

- Dual threshold capability can be turned on via RCP switch.. At the moment inclusive HI/LO clusters are made. User can fix clustering

CPS Stereo Clustering:

- Re-write cluster finding and the class which sends them to the L2 pre-processors - will be available in p11

- Make clusters for U/V and North/South combinations. LO clusters only

- Completely remove dependence on UnpDataChunk FT_L1
  (L2STT were also using this and have been warned that this chunk will not be there in p11)

- Are these clusters sent to L3? Jerry said that we will dicuss this post-shutdown

Making of I/OGen objects

- Make 3 IOGen objects to ship data from DFE boards to CTOC boards - l2io/l1ft.iogen

- DFEBoardL1Data

  - This object corresponds to Data Transfer between the DFEA and CTOC - used to make L1 decision
  - One such object/sector

- DFEBoardL2Data

  - This object corresponds to the Data Transfer between the DFEA and CTOC , on the recipet of L1 accept
  - This object contains individual track information.
    Max. 6 tracks/pT threshold. Max. 24 tracks/sector
  - One such object/sector

- DFEBoardL2CPSAData

  - This object corresponds to the CPSAxial Data Transfer between the DFEA and CTOC
  - This object contains individual cluster information.
    Max. 8 clusters/sector
  - One such object/sector

- DFEBoardtoMUData

  - This object corresponds to the Data Transfer between the DFEA and MUon . One object/sector
  - This object contains individual track information.
    Send the 6 highest pT tracks/sector

CTOC (octant) Boards

- Read the first 3 IOGen objects described on previous page

  - Information from 10 sectors are used to make up octant level information

  - Major truncation occurs here . We can send information for only 24 (highest pT) tracks/octant and 24 clusters/octant

- Send DFEBoardL1Data, DFEBoardL2Data, DFEBoardL2CPSAData to L3

- Make IOGen objects,
  OCTBoardL1Data, OCTBoardL2Data, OCTBoardL2CPSAData

- Need to finish track/cluster matching as mentioned previously

CTTT & Trigger Manager Boards

- Algorithms according to V7.0 (Jerry's notes)

- No change intended for p11

CTQD (Quadrant) Boards

- Read OCTBoardL2Data, OCTBoardL2CPSAData.

  - Information from 2 octants are used to make up quadrant level information

  - Some truncation occurs here . We can send information for only 46 (highest pT) tracks/octant and 46 clusters/octant

- Send information to L2 pre-processors using IOGen objects L1CTTTrackData & L1CPSAxialData

- Need to fix track/cluster matching as mentioned previosuly

Sending information to L2

- Information is sent to L2 pre-processors using MBTChannel software

- Fixed number of tracks/clusters are sent - pad with 0's if necessary

- CPSStereo information using IOGen object L1CPSStereoData - 46 clusters/U(V)/South(North)

- CFT and CPSAxial information using IOGen objects, L1CTTTrackData & L1CPSAxialData . 46 tracks (clusters)/quadrant

- Objects are unpacked at the other end using standard MBT unpacking software

- Total length of object is determined using No. of objects and (fixed) length of each object

Sending information to L3

- In p10, information is sent to L3 using CFTChannel software

- This has capability of sending variable length objects - will be available in p11

- Objects sent:

  - CTOC sends DFEBoardL1Data, DFEBoardL2Data, DFEBoardL2CPSAData - all to crate 2, module 10
  - CTTT sends OCTBoardL1Data crate 2, module 12
  - CFT_TM sends CFTBBoardL1Data crate 2, module 1

- Set ProcBits in header to distinguish between the first four objects (1 through 4)

- Cannot send all (first) three objects in the same event - cycle?

- In p11 , information sent to L3 will be "VRB mangled"

- Unpacking code needs to be written - Kyle/Josh?

- Once unpacker is available work on l1ft_analyze to read information sent to L3

After p11

Redesign the DFE part of the code - it works, but is a big mess. Bruno said that he wil look into it.